

REMARKS

This is in response to the Office Action mailed September 28, 2001, in the above-referenced application. Applicants confirm the election of Group I, Claims 1-7, 12 and 16, for substantive examination.

The rejections of record are addressed below in the order presented in the Office Action.

Claims 1, 6 and 16 are rejected under 35 USC Section 112, second paragraph, as indefinite. The Examiner objects to the term "CaCu₅ type." Applicants respectfully direct the Examiner's attention to page 5, lines 13-18 of the application, where this term is defined. Applicants respectfully submit that one skilled in the art would understand the meaning of this term and accordingly request withdrawal of this rejection.

Claims 1, 7, 12, and 16 are rejected under 35 USC Section 102(b) as anticipated by Visintin et al. Claim 1 is amended to incorporate the subject matter of Claim 3 therein. Claim 16 is similarly amended. As Claims 7 and 12 depend from Claim 1, and Claim 3 is not subject to this rejection, Applicants submit that this amendment obviates this rejection.

Claims 1, 2, 4-7, 12 and 16 are rejected under 35 USC Section 102(b) as anticipated by Yanagihara et al. As noted above, Claims 1 and 16 are amended to incorporate the subject matter as recited in Claim 3. Claims 2-4 are cancelled. As Claims 5, 7, and 12 depend from Claim 1, Applicants submit that this rejection is also obviated.

With regard to Claim 6, Applicants offer the following comments. The Examiner points to Example 8 of Yanagihara '557A as disclosing an alloy having the composition LaNi₃Co₁₇Mg_{0.3}. Although Yanagihara '557A does not refer to the length of the a-axis or c-axis, the Examiner argues that the alloy having the composition LaNi₃Co₁₇Mg_{0.3} would have the same lattice constants as those of claim 6.

To demonstrate the differences in structure of the alloy of Yanagihara '557A and Claim 6, an alloy having the composition LaNi₃Co₁₇Mg_{0.3} was prepared by the method described in Yanagihara '557A. The obtained alloy was ground in a mortar of stainless steel to form a powder and the lattice constants thereof were measured using a X-ray diffraction method. The a-axis and

c-axis lengths thereof were 5.045Å and 3.991Å, respectively. See the Rule 132 Declaration of Satoshi Shima, attached hereto. Thus, claim 6 is novel over Yanagihara '557A.

In addition, an alloy having the composition $\text{La}_{0.8}\text{Ce}_{0.12}\text{Pr}_{0.04}\text{Nd}_{0.04}\text{Mg}_{0.05}\text{Ni}_{4.36}\text{Co}_{0.2}\text{Mn}_{0.3}\text{Al}_{0.39}$ which contains 2.70 wt% Co and 0.28 wt% Mg was prepared by the method described in the present specification. The alloy and the hydrogenated alloy thereof were investigated using a X-ray diffraction method. The lattice constants and expansion percentages measured are shown as Example 33 in Table 7 of the Declaration. Also shown in Table 7 are results for the alloy having the composition of LaNi_5 as Comparative Example 20, LaNi_5 being a CaCu_5 type crystal structure. Thus, the elongations of a-axis and c-axis are smaller for Example 33 than for LaNi_5 . In other words, lattice distortion is less for Example 33 than for LaNi_5 . The lattice distortion causes the particle size reduction as the cycles of hydrogen absorption and desorption are repeated. Hence, the increase in surface area per unit weight can be suppressed for Example 33 so that the high rate discharge property is improved.

Claims 1, 2, 3, 7, 12 and 16 are rejected under 35 USC § 103 as unpatentable over U.S. Patent No. 4,004,943 to Boter. Claims 1 and 16 are amended to delete "Ca." Applicants respectfully note that Boter '943 does not teach Mg-containing compositions. Accordingly Applicants request withdrawal of this rejection as well.

The rejections of record having been addressed above, Applicants submit that this application is in condition for allowance which action is respectfully solicited. Should the Examiner have any questions regarding this matter it is respectfully requested that the Examiner contact the undersigned at his convenience.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required

In re: Maeda et al.
Appl. No.: 09/631,491
Filed: August 3, 2000
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therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit
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Respectfully submitted,



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United States Postal Service "Express Mail Post Office Addressee"
service under 37 CFR 1.10 on the date indicated above and is
addressed to: Assistant Commissioner for Patents, Washington, DC
20231, on January 28, 2002.



Grace R. Rippey

Version with Markings to Show Changes Made:

In The Claims:

1. (Twice amended) A hydrogen absorbing alloy having a CaCu_5 type crystal structure in its principal phase, comprising La in an amount of 24 to 33% by weight in the alloy, [and] Mg [or Ca] in an amount of 0.1 to 1.0% by weight in the alloy, and 6% by weight or less of Co in the alloy.

12. (Amended) A hydrogen absorbing alloy according to claim 1, wherein said alloy is represented by the formula $\text{La}_u\text{R}_v\text{Mg}_w\text{Ni}_x\text{Co}_y\text{M}_z$ [or $\text{La}_u\text{R}_v\text{Ca}_w\text{Ni}_x\text{Co}_y\text{M}_z$], wherein:

R is a rare earth element other than La;

M is at least one element selected from the group consisting of Mn, Al, Si, Sn, Fe, Cu, Ti, Zr, and V; and

the ratio of $(x+y+z)/(u+v)$ is 4 to 7.

16. (Amended) A nickel-metal hydride rechargeable battery comprising an electrode formed of a hydrogen absorbing alloy having a CaCu_5 type crystal structure in its principal phase, said alloy comprising La in an amount of 24 to 33% by weight in the alloy, [and] Mg [or Ca] in an amount of 0.1 to 1.0% by weight in the alloy, and 6% by weight or less of Co in the alloy.